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ITP4440

Rationale for the IRMA/DAMA 2000 Model Curriculum

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(note: a complete version of the curriculum model, including a listing of all members of the taskforce, can be found at http://gise.org/IRMA-DAMA-2000.pdf)

This document details an international information resources management (IRM) curriculum for four-year undergraduate level programs specifically designed to meet these needs. The curriculum provides a model for individual universities to tailor to their own situation. That is, the IRMA/DAMA Curriculum Model is a generic framework for universities to customize in light of their specific situations. This curriculum model prepares students to understand the concepts of information resources management and technologies, methods, and management procedures to collect, analyze and disseminate information throughout organizations in order to remain competitive in the global business world. These are all aspects of managing information. It outlines core course descriptions, rationales, and objectives and includes suggested specific course topics and the percentage of emphasis.

This Curriculum Model addresses the needs of two distinct sets of learners:

1. Students currently employed or seeking employment in the IRM field and,
2. All business students.

HISTORY OF THIS CURRICULUM

The IRM Curriculum Model presented here is a revision of two years of extensive research and efforts by an initial joint International Task Force on IRM Curriculum set up by IRMA (Information Resource Management Association) and DAMA (Data Administration Management Association). That IRM Curriculum Model began in October 1994. The present revision began in 1998 when members of the current task force were invited to bring the curriculum model up to date. This curriculum model was adopted at the IRMA International Conference in Anchorage, Alaska in 2000.

Relationship to IS '97

Three other IT-related organizations cooperated to produce the IS '97 curriculum model (Davis, Gorgone, Couger, Feinstein, and Longenecker, 1997). That model is designed to be generic, and does not specifically meet the needs of IRM programs. In contrast, the IRM curriculum model presented here is designed to match the specific needs for those teaching IRM. Our hope is that schools designing or revising their curriculum will use and benefit from both of these complementary models.

INTRODUCTION

Management Information Systems (MIS) literature has grown tremendously in recent decades as its concepts, applications, problems, and potentials evolved. More and more, effective management of the information resources is vital for both national and international firms. More to the point, increasingly firms and governments acknowledge their need for a workforce possessing IRM skills (National Academies, 1999) Increasingly, firms recognize that their very survival is dependent on their ability to use information as a strategic and operational resource.

What does this mean for higher education? It must provide a curriculum that provides students with new skill sets, different from those taught in the past. Educators need to provide future managers with a business orientation by specifically teaching information concepts and theories from the perspective of business problems. The new workplace demands a new curriculum.

ISSUES IN IRM EDUCATION

IRM recognizes information as a key resource. A key function of IRM is the study and dissemination of how best to use information to enhance the various organizational functions (Khosrowpour, 1989).

The Value of the Information Resource

One implication of the IRM concept is the need to see the big picture. In the past, people working in information processing departments held the limited view of computer-based information systems comprised solely of its hardware and software. We can blame this limited view in part on limits of their education to the technical aspects. Therefore, today's workers require an increased understanding of the people resources and business applications (Liscouski, 1991).

IRM's integration into all aspects of business during the past few decades created a demand for MIS professionals with abilities not limited to the technical side of information systems. The demand for workers who possess a broad understanding of business systems, organizational behavior, and management began more than a decade ago and has since swelled (Yaffe, 1989; Spruell, 1989). Understanding business systems is important because the integration of IRM into the firm is no longer limited to the formerly technical functions of the firm. At the same time, non-technical workers need to hold technical skills. For example, as word processors replaced typewriters, the role of the secretary who typed correspondence evolved into an office information manager. This new role requires greater use of cognitive skills to manipulate and interpret information through word processing, database, desktop, and graphics applications. (Regan and O'Connor, 1994.)

Organizational and Behavioral Issues

These changes in job demands require changes in education. In particular, today's MIS manager needs to provide more attention to the managerial aspects of IRM. Some MIS managers already find themselves ill equipped to cope with the behav-

This paper appears in *Managing Information Technology in a Global Economy,* the proceedings of the Information Resources Management Association International Conference.

ioral issues that arise in MIS management. More and more workers in organizations have become end-users of computing (e.g. Gasson, 1999; Lehaney, Clarke, Kimberlee, & Spencer-Matthews, 1999.)

Integration of IRM into and across all Functions

Today companies need information systems capable of meeting not only internal company needs, but also the needs of its customers and suppliers. In a given organization, the IS Department no longer is strictly a separate function; rather, it has become a function integrated into all departments. The effective MIS manager must have the knowledge to further integrate separate technologies (data processing, telecommunications, etc.) within the organization and to support end-users during this integration. (Cohen & Boyd, 1999b)

The integration of technology into the workplace increases security risks, from theft, loss of data integrity including record alterations, and fraud. MIS managers must be knowledgeable in risk management to deal effectively with these risks (e.g. Warden & Trauth, 1999).

Summary

Considering all the issues of information resources management, we have identified the following as critical issues in managing the information resources:

- Environment: Today IS manager must manage a decentralized, end-user-focused environment.
- Role: The current IS manager, instead of serving as the technical custodian of computer hardware entities, now functions more like an agent between IS resources and end-users.
- Expanding Focus: The IS manager must understand the global issues of the business and its customers, as well as have a comprehensive knowledge of global information resources management. Information technology has expanded on an international level and, as such, the present focus is now on matters that are more global in nature. The influx of technology into nearly every country has opened a cross-cultural window into other nations that, to this point, was unavailable.
- Integration: In a given organization, the IS department is no longer strictly a separate function, rather, it is an integrated function of all departments.
- Increased Risks: IS managers must be knowledgeable enough to effectively deal with greatly increased security risks brought about by the integration of technology.
- Inadequate Preparation: Business schools continue to graduate students lacking basic knowledge in information resources management.

EDUCATION FOR IRM

The first MIS model curricula were developed in the late 1960s. At that point, businesses viewed their new MIS as a support function. The primary objective of these newly formed MIS programs was to train specialists in programming languages, compilers, and operating systems skills. In addition, something new was beginning to emerge. MIS departments were assisting decision-makers in determining both their information needs and the services that they could obtain from information systems. The age of the Systems Analyst had arrived.

A quick analysis of the MIS model curricula during the 1970s and early 1980s clearly shows an emphasis on programming and analytical courses. Furthermore, the main emphasis was on hardware and software components of computer-based systems, rather than on information and information users (Mandt, 1982). Even then, proponents of MIS education were recommending the inclusion of courses in oral and written skills, problem solving, and leadership (Metz, Greenhill and Smith, 1983).

In the 1990's, a new focus evolved in business, the management of information resources—domestically and globally—to benefit organizations. The old needs did not disappear. Firms still needed to manage their information systems. Schools that continued to follow the existing MIS curriculum continued to meet those needs. Nevertheless, they failed to meet the new demands for graduates in information resource management.

This is not to say that MIS programs are flawed. Industry continues to need graduates trained in management information systems. Industries' needs have expanded. Furthermore, the gap between industry needs and education is far from new. In the beginning, industry had to do all the training for their new DP jobs. Even in 1983, tremendous growth in technology and information exceeded the accompanying education, thereby forcing a greater gap between the need to understand and apply information and the ability of the MIS professional to accomplish this task (Porter, 1983). Therefore, there are differing needs between these two job functions and universities programs should acknowledge these differing needs by establishing separate tracks within their MIS/IRM program. Commentators acknowledge that MIS education is overdue for a major overhaul to catch up with current trends and demands of the information management age (Ahern, 1992; Laribee, 1992).

Two efforts by professional organizations came out in this period to address the problem. The DPMA (renamed later as AITP) and ACM joined forces with the Association for Information Systems (AIS) to create a joint model curriculum, IS '97. IS '97 offers the educator a great deal and is a serious contribution. Its strength in attempting to meet the needs of all university programs is also its weakness. It is broad, attempting to contain within its tent programs as varied from applied computer science to management of the information system. Consequently, it cannot provide detailed guidance for those developing a program in IRM education. The second effort is this IRMA/DAMA model. It is our hope that educators will benefit from their examination of both IS '97 for its generality and IRMA/DAMA '2000 for its detailed IRM content, as seen below (Srinivasan, Guan, & Wright, 1999).

New Themes in IRM Education

This curriculum model needs to address the needs of the workforce for the twenty-first century. These needs have been examined in depth and include the following abilities (Cohen & Boyd, 1999; Lin, 1999).

Interpersonal Skills & Communication

Employers ask colleges and universities to provide them with students who possess interpersonal skills and the ability to communicate, both orally and in business writing. This requirement is consistent from study to study and holds equally for information system jobs as it does for others (e.g., US Department of Labor 1992, US Department of Labor 1997;Longenecker, Feinstein, Haigood, and Landry, 1999; Lee, Trauth, & 1995).

Team Work

These findings above also show that today's jobs require working effectively as members of teams. In the past, IS workers jobs depended purely on technical abilities. Their jobs were

conceived as a strictly line position, concerned with the supervision and operations of computer systems, and the preparation of computer-generated outputs that were used predominantly by accountants, controllers, and inventory managers. Today's jobs are for teams of people working in collaboration (Richards, Yellen, Kappelman, & Guynes, 1998)

Understanding Human and Organizational Behavior

In recent years, the role of the IRM/MIS department in business has grown from meeting the needs of only the internal clients to meeting the needs of customers, suppliers, investors, the government, and others. The growth of the Internet and the wide adoption of its technology have spurred this growth. Therefore, our students must now be proficient in many new topics, such as human/computer interaction, understanding customers' needs, legal aspects and people aspects of web design, and Internet technologies (Stein, Bull & Burgess,1995).

Legal, Ethical, and Social impacts of IRM

Increasingly firms demand that all employees understand the ethical implications of their decisions. In the Longenecker, Feinstein, Haigood, and Landry (1999) study, ethics ranked fourth in importance in a study of what employers want of graduates. (Professionalism was fifth.)

One cannot separate ethics from the rest of one's learning nor from one's culture (Whitman, Townsend, Hendrickson and Fields, 1998). For this reason, we recommend the study and application of methods for ethical analysis in several courses.

Global Information Issues

The education and training of future MIS managers must ensure that these information experts are capable of developing and implementing effective corporate strategic plans that will succeed in both a national and global business environment. From a government point of view, nations wishing to compete successfully must grow technologically and provide job-oriented education in the field of MIS (Cohen, 1998b; Granger & Lippert, 1998; Deans & Goslar, 1993; Yellen, 1997-8; Cheney & Kasper, 1993.).

Integration of IRM into all business functions

Today companies need information systems capable of meeting not only **internal** company needs, but also the **external** needs, of its customers and suppliers. In a given organization, the IS Department no longer is strictly a separate function; rather, it has become a function integrated into all departments. The effective MIS manager must have the knowledge to further integrate separate technologies (data processing, telecommunications, etc.) within the organization and to support end-users.

Information Security & Quality

One impact of this integration of technology in the workplace is the increase in security risks through theft, loss of data integrity including record alterations, and fraud. MIS managers must be knowledgeable enough to effectively deal with these risks (Applegate, Cash, Mills, and Quinn 1988; Khalil, Strong, Kahn, Pipino, 1999).

Topical Relevance

We note a strong call for changing what and how we teach to make school more relevant to the job market (Hale, Sharpe, & Hale, 1999; Granger & Lippert, 1998; Burn & Ma, 1997).

PC/Internet/Intranets/E-commerce

The skill set required of graduates has expanded. Personal Computer (PC) and Internet technologies are greatly in demand in today's business. Business's rapid embrace of electronic commerce (e-commerce) means firms look increasingly for our graduates to be prepared in these fields. (Athey & Plotnicki, 1998; Slater, 1999)

Introducing IRM Concepts to All Business Students

For some of the resources of productions, Business schools have done a good job in educating students: people, money, material, equipment, and management. Shockingly, most fail to adequately educate students to manage information, the emerging key resource of production (Dede, 1989; Jackson, 1992).

One solution to this problem is to teach a separate foundation course in information resources. The IRM Foundations course would be similar to principles of marketing or principles of accounting. In it, students would learn about the information resource, its characteristics, utilization, and management.

The current situation at most universities is quite different. Commonly, business students take a computer-skills course as freshmen, followed later by an elective course on IRM/MIS concepts. The message conveyed by this situation is that knowledge of IRM/MIS concepts is less than essential for success on the job. The current situation explains why the employers and governments are calling for revamping business education.

PROPOSED IRM CURRICULUM

What is new in this curriculum model? The traditional MIS curriculum stressed hardware and software, all but ignoring human concerns. The heavy emphasis given to hardware and software over the human components of the systems led in the past to serious problems. (The human component of these systems is not limited to people within the systems, but extends to all end-users and anyone within the organization affected by the information system.) To overcome this limitation of the past, we as teachers must teach the organizational impact of information systems, how these systems fit into the organizational structure of the firm, and how managers can utilize the products of information systems across the company. The first new element to this curriculum is the emphasis on the human elements.

A second element that is new to this curriculum model is the focus on information as a resource. Generally, the model IS curricula of the past has been based on the narrow definition of the computer-based information system as a collection of hardware and software. The critical concepts of IRM outlined here are the foundation of the first two courses in the curriculum: *Information Resources Management Principles* and *Information Systems Technology*. The concepts of IRM are further related to all courses with the MIS program. Other courses offered in this curriculum focus on specific IS topics with supplements of information resources management concepts and applications.

The foundation of any IRM curriculum must begin with an introduction of IRM concepts to all business students, with all subsequent courses building on these concepts to form the curriculum. Critical IRM concepts include:

- The recognition of information as the major organizational asset,
- An understanding of the principles of the characteristics, utilization and management of information,
- An appreciation of the value and importance of information resources in all functional areas of a business, and
- A familiarization with the value and types of information,

characteristics of effective information, users and sources of information, economy of information, managerial functions in information-oriented decisionmaking, and the relationship between information resources and other organizational resources.

The IRM course is appropriate for university juniors, provided those students have already taken a course in organizational behavior or principles of management course that enables them to understand the organizational and managerial implications of information resource management. The following pages list all of the proposed courses for the IRM curriculum along with course rationale, objectives and assorted topics. It should be emphasized again that the proposed IRM Curriculum Model should be considered as a generic framework. Adopters should adapt from these guidelines to meet the needs of their local clientele.

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